

## CLAIMS.

The claims defining the invention are as follows:

Claim 1]. A tilting vehicle, comprising:

- \* at least one section of the vehicle tiltable about the longitudinal axis of the vehicle;
- \* tilt registration means, recording variations in the tilt position of the tiltable section of the vehicle;
- \* a control element, for the driver;
- \* tilt control means, connecting the control element to the tilting action of the tiltable section of the vehicle;
- \* at least three wheels, including wheels laterally spaced, at least one front wheel, and at least one rear wheel;
- \* a castoring element, including at least one front wheel which is able to tilt with the tiltable section of the vehicle and is dynamically directionally controllable due to the tilt of the tiltable section of the vehicle and the speed of the vehicle;
- \* a vehicle speed sensitive control signal transmitter;
- \* a variable force steer transmitter, which is connected to the castoring element, to the tilt registration means, and to the speed sensitive control signal transmitter, the said variable force steer transmitter being able to exert a directing moment and/or positioning moments on the castoring element, that directs and/or positions the castoring element according to the tilt registration and the force exerted by the variable force steer transmitter, and the force exerted by the variable force steer transmitter is variable according to control signals from the vehicle speed sensitive control signal transmitter.

Claim 2]. A tilting vehicle as in claim 1 wherein the tilting control means further includes at least one sensor, for

measuring the magnitude and/or the direction of the load resisting a change to the tilt angle of the tiltable section of the vehicle, and for measuring the magnitude and/or the direction of the load tending to create a change in the tilt angle of the tiltable section of the vehicle, connected to at least one power assist tilt drive element, for tilting the tiltable section of the vehicle about the longitudinal axis of the vehicle in order to produce a tilt according to the measurements made by the at least one sensor.

Claim 3]. A tilting vehicle as in claim 2 wherein two sensors are independently sensing, and two power assist tilt drive elements are independently driving, and wherein one sensor is connected to one power assist tilt drive element and the other sensor is connected to the other power assist tilt drive element.

Claim 4]. A tilting vehicle as in claim 3, wherein a sensor incorporates a twistable element which connects the control element and the tilting action of the tiltable section of the vehicle to one another, the degree and the direction of the twist of which element is a measure for the magnitude and the direction of the load resisting a change to the tilt angle of the tiltable section of the vehicle and the load tending to create a change in the tilt angle of the tiltable section of the vehicle.

Claim 5]. A tilting vehicle as in claim 3 wherein a power assist tilt drive element is a double acting hydraulic cylinder/piston assembly or two single acting hydraulic cylinder/piston assemblies, and a sensor is a hydraulic rotary spool valve connected to a hydraulic pump.

Claim 6]. A tilting vehicle as in claim 1 wherein a castoring element includes two front wheels supported in steer pivot suspension structures, which are pivotally attached to tilting linkage structure, which is rotatably attached to the tiltable section of the vehicle, to enable interdependent side to side tilting of the tiltable section of the vehicle and the

steer pivot suspension structures relative to the ground, and also to enable side to side steering movement of the steer pivot suspension structures, and with steer transmitting structure connecting each steer pivot suspension structure to the variable force steer transmitter.

Claim 7]. A tilting vehicle as in claim 6, wherein each front wheel is fitted to an axle to allow rotation of the wheel when the vehicle is under way, and each axle is attached to a carrier which is located by and slides on a parallel bar guide when the wheel moves in suspension, and the parallel bar guide is formed within a steer pivot suspension structure, and the parallel bar guide is aligned with the parallel bars substantially in the same plane as the wheel, and with the parallel bars substantially parallel to the steer pivot suspension structure pivot axis, and a suspension element is fitted between the carrier and the wheel pivot suspension structure, and a steer lever arm is attached to the steer pivot suspension structure to allow a steering moment to be applied.

Claim 8]. A tilting vehicle as in claim 1 wherein the tilt registration means is a switching element connected to the tilting action of the vehicle.

Claim 9]. A tilting vehicle as in claim 1 wherein a vehicle speed sensitive control signal transmitter is an electronic control unit.

Claim 10]. A tilting vehicle as in claim 1 wherein the variable force steer transmitter includes a variable coupling with the output torque of the coupling proportional to an electric control signal.

Claim 11]. A tilting vehicle as in claim 1 wherein the variable force steer transmitter includes a resilient element connected to the castoring element.

Claim 12]. A tilting vehicle as in claim 1, wherein the control element comprises a steering wheel or steering bar rotatable about a steering column.

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